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Work Summary
1989 NASA/ASEE Summer Faculty Fellowship Program
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Infrared/Submillimeter Optical Properties Data Base

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This second summer's project was a continuation of the previous summer project. The general goal remained to build a data base containing optical properties, such as reflectance, transmittance, refractive index, in the far infrared to submillimeter wavelength region. This data base would be limited to selected crystalline materials and temperatures between 300K and 2K. The selected materials were: the fluorides of barium, calcium, lithium, lead, and strontium; the bromides of potassium and thallium; the carbides of silicon and tungsten; and the materials of KRS5, KRS6, diamond, and sapphire.

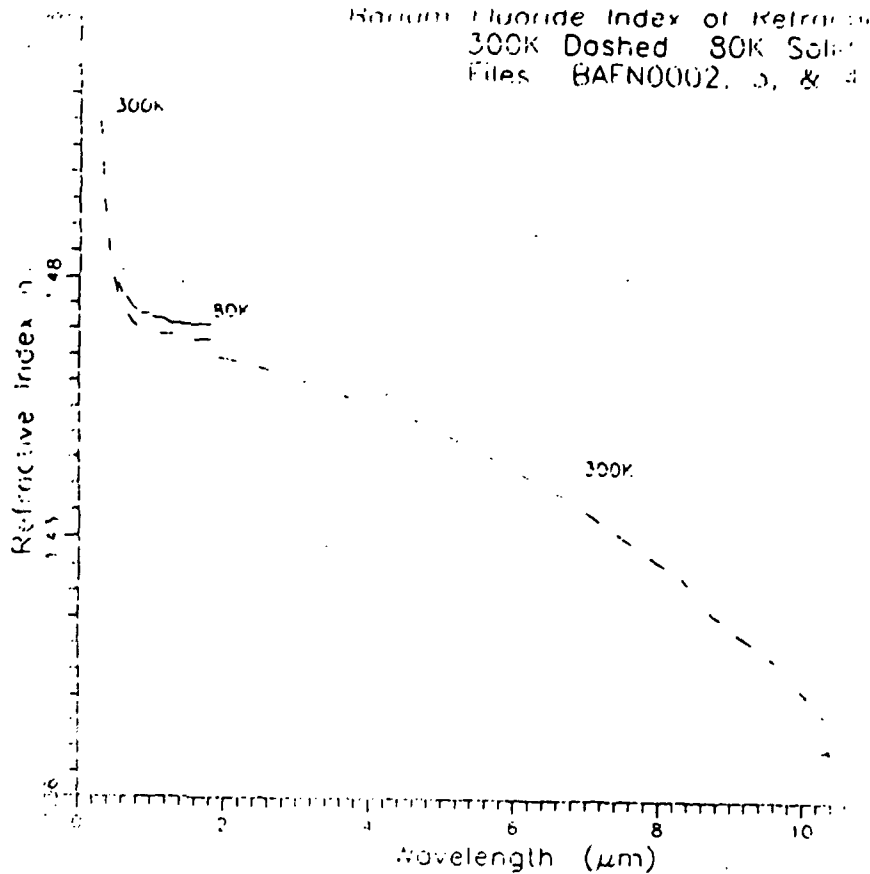
Last summer, barium fluoride was selected as prototype material for building the data base. This summer the literature search, preparation of the data for barium fluoride was completed. In addition the literature search for data related to the compounds mentioned above was completed. The current status is that barium fluoride is in a form suitable for a NASA internal publication. The papers containing the data on the other materials have been xeroxed and they are ready to be reduced.

On the reverse side, the top figure is a sample combination of data for the index of refraction at 300 K. The lower figure shows the transmittance vs wavelength at 300 K and 80 K. These figures are a sample of many which have been developed.

Since barium fluoride has been studied more than most of the materials listed above, it is clear that additional measurements should be made to "fill in" the gaps present in both temperature and wavelength data. This information is of particular interest to those designing or using apparatus operating in the wavelength region from the far infrared to submillimeter.

Last summer's work was used to aid in obtaining RTOP funding for to start investigating the properties of the above mentioned materials.

Barium Fluoride Index of Refraction
 300K Dashed 80K Solid
 Files BAFN0002, 3, & 4



Barium Fluoride Transmittance
 300K dashed 4K solid
 Files BAFT300 & BAFT0004

